

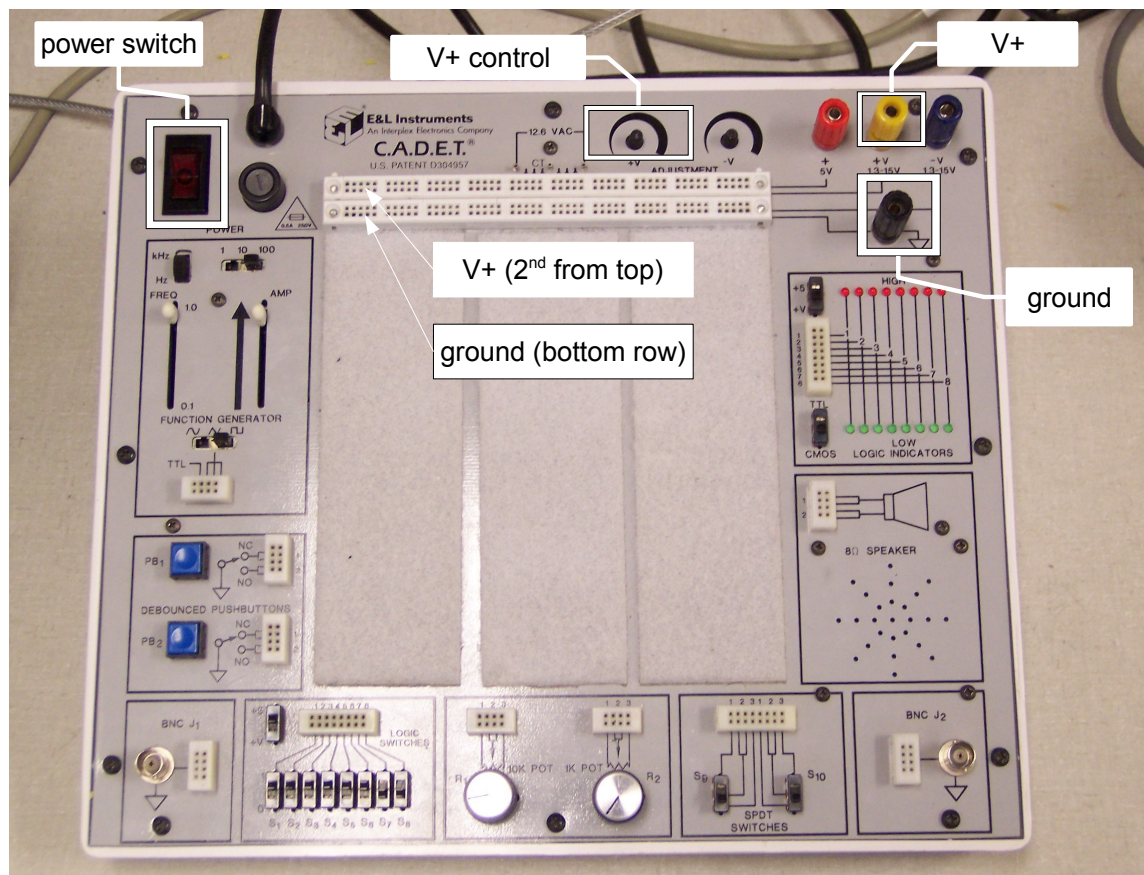
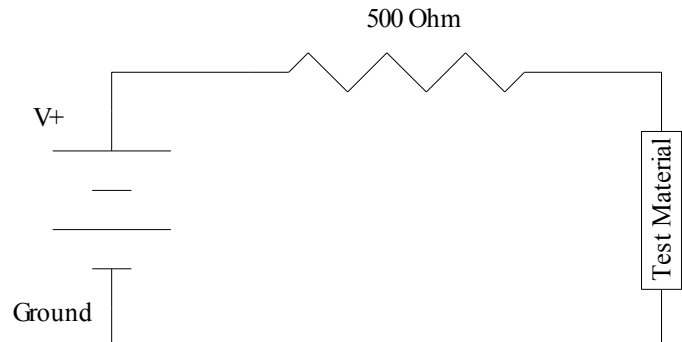
Univ 189 Voltage/Current Lab Procedure

Equipment

- Cadet Board
- Multimeter
- 500 Ohm Resistor
- Test Materials

Setup

Get your materials and connect the circuit as shown. Two resistors connected in series can be substituted for a 500 Ohm resistor if their resistances sum to 500. Also, it is not necessary to have exactly 500 Ohms, the point is to limit the current through the circuit. Turn the knob for V+ to the lowest level (all the way counter-clockwise).



Experiment

Turn on the Cadet board. Make sure the multimeter leads are plugged into the appropriate sockets for measuring voltage¹. Set the multimeter to measure voltage and measure the voltage across the test section. Break the circuit to measure the current. Change the leads for the multimeter to the current measurement sockets, if necessary. Set the multimeter to measure on the order of hundreds of mA. If you get a reading of zero or near zero, use a more sensitive setting. Be careful about using a setting that is too sensitive for the amount of current you are measuring, because some multimeters have separate fuses for different settings. Record the voltage and current measurements, along with the length (1, 2, 3, or 4 ft.) and diameter (i.e. if it has one or two wires) of the test material.

Break the circuit by disconnecting one of the components. Set the multimeter to measure voltage again, and adjust the voltage of V+ with the control knob. Measure the voltage between V+ and ground with the multimeter, increasing the voltage by about 2 V. Repeat the voltage and current measurements with the new setting. Continue until V+ is at around 10 V. Do not go over 10 V, you may burn out the resistor. You should make at least 4 voltage/current measurements per test material.

When you are finished with the first test material, get another and repeat the above procedure. You should measure at least 3 materials. Finally, verify that the resistor obeys Ohm's Law repeating the above procedure with no test material (this will also allow us cancel the effects of the resistor).

In the end, you should have 4 columns (voltage, current, length, diameter) and 16 or more rows (one for each measurement set).

Cleanup

When you have finished the experiment, put all of your wires, resistors, etc. away carefully. Double check that any resistors you put in a bin match the label on the bin. Make sure you turn off all the equipment, and leave everything as good as or better than you found it.

¹ Your multimeter may have a single socket for voltage and current measurements.